REMARKS

Specification

In paragraph 1 of the Office Action, the specification and claims were objected to based on minor informalities. Following the suggestion of the Office Action, Applicants have reviewed the specification for grammatical and spelling errors and submit an amended specification, with a redlined version at Appendix A and a non-redlined version at Appendix B. Applicants have further added a "Brief Description of the Drawings" section on page 6 of Appendix A. Applicants do not believe that any new matter is added by this amendment.

Rejections Under 35 U.S.C. §112, second paragraph

Claims 1-13 have been rejected under 35 U.S.C. §112, second paragraph as being indefinite for failing to distinctly claim the subject matter of the invention. Applicants have amended the claims where it is believed appropriate.

Rejections based on Sevcik (U.S. Patent No. 6,266,699)

Claims 1-5 and 8-13 have been rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,266,699 to Sevcik ("**Sevcik**"). Further, claims 6-13 have been rejected under 35 U.S.C. §103(a) as being unpatentable over **Sevcik** in view of U.S. Patent No. 6,292,789 to Schutzer ("**Schutzer**") and U.S. Patent No. 6,286,039 to Van Horne et al. ("**Van Horne**"). **Sevcik** alone or in combination with **Schutzer** or **Van Horne**, do not make out a *prima facie* case of anticipation or obviousness, because elements of the claimed invention, as amended, are not disclosed, taught or suggested by these references. The references fail to teach or suggest any modifications to their disclosure to obtain the claimed invention.

The **Sevcik** reference discloses a service control point (SCP) that controls routing of internet traffic and billing of the traffic. In practice, a user seeking to access a specific server does so via the SCP. The SCP, prior to access, determines if the user is entitled to access based on "stored user groups." Col. 2, lines 62-67. Specifically, the SCP checks whether the user is a member of a group entitled to access and checks whether the user supplies a correct PIN. Col. 3, lines 5-9; col. 4, lines 36-47. If the user is entitled to access, the SCP bills the user.

The **Schutzer** reference discloses a system for a consumer to access his or her bills electronically. The system includes a server which receives billing information from third parties, formats the billing information, and stores the formatted billing information. A consumer may then access the stored information. The **Schutzer** reference does not disclose any billing method based on routing of information in a communication network.

The **Van Horne** reference discloses a system and method for remotely connecting a client computer to the Internet using a server. The system provides billing options, such as "credit cards, prepaid access cards, smart cards or direct charges" to the client computer for access to the Internet. Col. 16, lines 53-66. The client computer chooses one of the options and enters billing information for the options selected. See col. 17, lines 2-8. After which, the client may gain access to the Internet. Col. 17, lines 34-41. The **Van Horne** reference does not disclose any billing method based on routing of information in a communication network.

Claim 1: The Office Action asserted that **Sevcik** teaches all elements of claim 1. Applicants respectfully disagree and wish to point out that **Sevcik** does not disclose the particular elements as asserted.

Claim 1 recites "recording network addresses for the information provider server and billing management information for identifying whether the information provider server is billed" and "determining whether or not said information provider server is to be billed based on the detected network address and said billing management information". Applicants' specification discloses a subscriber database UDB, one example of which is shown in Figure 2. The subscriber database UDB may correlate URLs for an information provider server with billing information (*e.g.*, IP BILLING/USER BILLING). In practice, information may be sent to a user terminal for different URLs in an Information Provider Server. Billing is determined based on the billing information which is correlated for the different URLs. This correlation allows for a very robust and tailored billing system when providing information services from an information provider server. In effect, an Information Provider Server may be billed for one URL while a user may be billed for a second URL.

By contrast, the **Sevcik** system teaches a different, and much more limited, billing system. The **Sevcik** system is a crude form of billing whereby a user is always billed for accessing the server. This determination whether to bill the user is based solely on whether

the user is registered for access to the server. The user, in effect, will be billed for anything from the server. Thus, the **Sevcik** system does not teach or suggest "recording network addresses for the information provider server and billing management information for identifying whether the information provider server is billed" and "determining whether or not said information provider server is to be billed based on the detected network address and said billing management information", as taught in claim 1. The **Schutzer** and **Van Horne** references fail to remedy the deficiency of the **Sevcik** reference since both do not teach or suggest tailoring the billing to specific network addresses. For the above reasons, claim 1 as amended has traversed the Office Action's rejection, and is patentable over the cited references. The claims dependent on claim 1, which include the limitations of claim 1 and additional limitations, are also patentable for at least the same reasons.

Claim 4: The Office Action asserted that **Sevcik** teaches all elements of claim 4. Applicants respectfully disagree and wish to point out that **Sevcik** does not disclose the particular elements as asserted.

Claim 4 recites "receiving, from said information provider server, billing information other than a network address of the information provider server and information to be delivered to a user terminal" and "determining which party, from at least two parties, to bill for routing the information, wherein determining is based on said billing information". In this aspect of the invention, billing is determined based on billing information sent from the information provider server. The billing information, which is not the network address of the information provider server, enables dynamic billing dictated by the information provider server.

Applicants' specification discloses several procedures wherein the information server provider sends billing information, other than a network address of the information provider, to the transfer device. The billing information is used to determine which party is billed. One example is including an address of a mailbox in the gateway server. The information provider server may include the address of the second mailbox BOX2 of the gateway server. Page 16 of the specification, lines 16-20. Based on this address information (*e.g.*, BOX2, BOX3) provided by the information provider server, the billing information may be determined. See page 21, lines 4-12. Another example is applying a tag to HTML data sent

from the information provider server to the gateway server. The tag may indicate which party to bill. See page 24, line 20 – page 25, line 1.

The **Sevcik** system teaches a different billing system than that which is currently claimed. As discussed above, the **Sevcik** system determines whether to bill the user based on the user's access to the server. Thus, the **Sevcik** system (1) does not send billing information, which is not the network address of the information provider server, to the SCP; and (2) does not determine billing based on the billing information. The **Schutzer** and **Van Horne** references fail to remedy the deficiency of the **Sevcik** reference since both do not teach or suggest billing information provided by the information provider as claimed in claim 4. For the above reasons, claim 4 as amended has traversed the Office Action's rejection, and is patentable over the cited references. The claims dependent on claim 4, which include the limitations of claim 4 and additional limitations, are also patentable for at least the same reasons.

Claims 6 and 7: The Office Action asserted that **Sevcik** taught all elements of claim 6, except for teaching a transfer device which includes a mailbox for mediating push-type information transmission, storing in said mailbox information mail sent from said server device designating a desired destination and the address of said mailbox, transmitting the information mail stored in said mailbox to user terminals which are the designated destination, or performing a billing procedure with respect to the information provider which offered said information transmission with respect to push-type transmission services through said mailbox. The Office Action stated that the limitations not found in **Sevcik** are taught in **Schutzer** and **Van Horne**. Applicants respectfully disagree and wish to point out that **Sevcik** does not disclose the particular elements as asserted. Applicants also point out that even after combining the cited references, one does not obtain the claimed invention as amended.

Similarly, the Office Action asserted that **Sevcik** taught all elements of claim 7, except for teaching a transfer device which includes an IP mailbox for mediating push-type information transmission, a user-billed mailbox for mediating information transmission that is not subject to IP billing, performing a billing procedure with respect to the information provider, and performing a billing procedure with respect to the user. The Office Action stated that the limitations not found in **Sevcik** are taught in **Schutzer** and **Van Horne**.

Again, applicants respectfully disagree that the cited references render amended claim 7 obvious.

Claim 6 recites "receiving, from said information provider server, address information for said mailbox, information to be delivered to a user terminal, and a desired destination of the user terminal" and "billing the information provider server for push-type transmission services through said mailbox." Claim 7 recites "receiving, from said information provider server, address information for said information provider server mailbox and first information to be delivered to a user terminal" and "billing the information provider server for at least a portion of the first information".

As discussed above, one aspect of the invention comprises billing information sent from the information provider server. The billing information, as claimed in claim 6 or 7, may comprise an address of a mailbox on the transfer device for storage of information from the information provider server. Billing may then be determined based on "push-type transmission services through said mailbox."

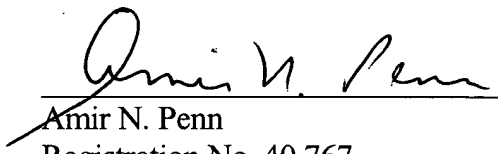
None of the references cited, either alone or in combination, teach the above limitations. The **Sevcik** reference does not teach storing information in a mailbox, let alone determining billing based on the storage in a mailbox. The **Schutzer** reference, while teaching storing a bill in a mailbox, does not teach, or even suggest, determining billing based on the storage in a mailbox. The **Van Horne** reference, similar to the **Sevcik** reference, fails to teach or suggest the use of a mailbox and fails to teach determining billing based on the storage in a mailbox. For the above reasons, claims 6 and 7 as amended has traversed the Office Action's rejection, and is patentable over the cited references. The claims dependent on independent claims 6 and 7, which include the limitations of the independent claims and additional limitations, are also patentable for at least the same reasons.

Applicants add new claims 14-66, which have different limitations and are of different scope than the amended claims. Nevertheless, the newly added claims are patentable over the cited art. Further, the arguments presented above may not necessarily apply to the newly added claims.

SUMMARY

Applicants submit that based on the foregoing remarks, the rejections have been traversed, and that the claims are in condition for allowance. Should there be any remaining formalities, the Examiner is invited to contact the undersigned attorneys for the Applicants via telephone if such communication would expedite this application.

Respectfully submitted,



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DESCRIPTION

BILLING METHOD FOR COMMUNICATION NETWORK

Technical Field

The present invention relates to a billing method for a communication network wherein a server device provides information to a plurality of user terminals ~~are provided information from a server device~~.

Background Art

Pull-type information transmission is known conventionally in the field of information providing services which use the Internet. In general, pull-type information transmission ~~wherein~~ occurs when a user accesses a server device of an information provider from a communication terminal, such as a personal computer or the like, to download desired information ~~has been known conventionally in the field of information providing services which use the Internet~~. Additionally, push-type information transmission, wherein information is provided to the user from the server side without awaiting access by a user, has been proposed in recent years.

Communication networks have become more complicated and diversified of late. Accordingly, ~~so that~~ the forms of networks in which various routers exist between the server device and the user terminal have also increased, such as by interposing a gateway device between the networks with different protocols ~~have also~~

~~increased~~.

Disclosure of the Invention

As the forms of networks diversify as described above, the types of services for information transmission are becoming various, and billing by communication fees or information fees is desired as appropriate to each type of service.

The present invention has been made in consideration of this type of situation, and has the purpose of offering a billing method for an information communication network capable of performing billing suited to the information transmission service type.

In order to resolve the above problem, a first aspect of the present invention is a billing method in a communication network including an information provider server device, a plurality of user terminals which receive information from the server device and a transfer device for routing information transmission between the server device and the user terminals; wherein the transfer device comprises:

a step of recording billing management information for identifying server devices which are to be subject to IP billing (IP billing means that charges for the information providing services are made not to users but to IP (Information Provider).);

a step of detecting a network address of the server device designated when the user terminal receives an information transmission from the server device;

a step of determining whether or not the server device is to be subject to IP billing based on the detected network address and said billing management information; and

a step of performing a billing procedure with respect to the information

provider which performed the information transmission if the server device is determined to be subject to IP billing.

Additionally, in the above-described first aspect of the present invention, the transfer device may be such as to not route an information transmission if it is determined not to be subject to IP billing.

Additionally, a second aspect of the present invention is a billing method in a communication network including an information provider server device, a plurality of user terminals which receive information from the server device and a transfer device for routing information transmission between the server device and the user terminals;

wherein the server device comprises:

a step of including billing information which indicates whether or not to use IP billing which is billing with respect to the information provider in the transmission data supplied to the user terminals in response to a request; and

the transfer device comprises:

a step of determining whether or not the information transmission is subject to IP billing based on the billing information when routing the exchange of the transmission data; and

a step of performing a billing procedure with respect to the information provider which provided the information transmission if it is determined to be subject to IP billing.

Additionally, in either the above-mentioned first or second aspect of the present invention, the transfer device may be such as to perform a billing procedure with respect to users who have received the information transmission if it is determined not to be subject to IP billing.

Additionally, a third aspect of the present invention is a billing method in an information communication network including an information provider server device, a plurality of user terminals which receive information from the server device and a transfer device for routing information transmission between the server device and the user terminals; wherein the transfer device comprises:

a mailbox for mediating push-type information transmission that is subject to IP billing which is billing with respect to the information provider;

and comprises:

a step of storing in the mailbox information mail sent from the server device designating a desired destination and the address of the mailbox;

a step of transmitting the information mail stored in the mailbox to user terminals which are the designated destinations; and

a step of performing a billing procedure with respect to the information provider which offered the information transmission with respect to push-type transmission services through the mailbox.

Additionally, a fourth aspect of the present invention is a billing method in a communication network including an information provider server device, a plurality of user terminals which receive information from the server device and a transfer device for routing information transmission between the server device and the user terminals;

wherein said transfer device comprises

an IP-billed mailbox for mediating push-type information transmission that is subject to IP billing which is billing with respect to the information provider; and

a user-billed mailbox for mediating information transmission that is not subject to IP billing;

and performs a billing procedure with respect to the information provider which offered the information transmission with respect to push-type information transmission services through the IP-billed mailbox; and

a step of performing a billing procedure with respect to the user that received the information transmission with respect to information transmission services through the user-billed mailbox.

Additionally, in the present invention, the object of the billing may be a communication fee with respect to communication services for the information transmission or may be an information fee with respect to information provided by the information transmission.

Additionally, the transfer device may be such as to perform a billing procedure of information fees with respect to users if it is determined as not being subject to IP-billing, and otherwise not perform a billing procedure of information fees.

Additionally, in the present invention, the server device may belong to a first communication network following a first communication protocol and the plurality of user terminals belong to a second communication network following a second communication protocol different from that of the first communication network; and the transfer device may be a gateway for converting between the first and second communication protocols and routing information transmissions.

Additionally, in the present invention, the second communication network may be a local network accommodating specific user terminals; and the first communication network may be a global network interconnecting information resources such as the server device assigned identification information for identifying an absolute network address.

Additionally, in the present invention, the second communication network may be a mobile communication network accommodating a plurality of user terminals which are mobile terminals, and the first communication network may be the Internet.

Brief Description of the Drawings

Fig. 1 is a block diagram showing the overall structure of an example system according to an embodiment of the present invention.

Fig. 2 is a data format diagram showing the contents of an example subscriber database illustrated in Fig. 1.

Fig. 3 is a block diagram showing an example structure of a gateway server illustrated in Fig. 1.

Fig. 4 is a sequence diagram showing an example of the basic operations of pull-type information transmission within the system illustrated in Fig. 1.

Fig. 5 is a sequence diagram showing an example of the basic operations of push-type information transmission within the system illustrated in Fig. 1.

Fig. 6 is a conceptual diagram showing a first embodiment of the services according to the push-type information transmission illustrated in Fig. 5.

Fig. 7 is a conceptual diagram showing a second embodiment of the services according to the push-type information transmission illustrated in Fig. 5.

Fig. 8 is a flow chart showing an example billing procedure for the case of the pull-type information transmission illustrated in Fig. 4.

Fig. 9 is a flow chart showing an example billing procedure for the case of the push-type information transmission illustrated in Fig. 5.

Fig. 10 is a screen transition diagram for explaining a variant of the present

invention.

Best Modes for Carrying Out the Invention

~~Herebelow~~ Hereinafter, an embodiment of the present invention shall be explained with reference to the drawings. This embodiment is structured as a system wherein the present invention is applied to a mobile packet communication network. The present invention is not restricted to the following embodiment, and various modifications are possible within the range of the technical concept thereof.

A: Structure of Embodiment

(1) Overall Structure of System

Fig. 1 is a block diagram showing an embodiment of the present invention.

In the drawing, MS denotes a mobile station which receives packet communication services from a mobile packet communication network MPN. ~~This mobile~~ Mobile station MS is connected ~~not only~~ to the mobile packet communication network MPN shown in the drawing, ~~but also~~ Mobile station MS is also connected to a mobile telephone network which is not shown, and is therefore capable of receiving mobile telephone services as well. The mobile station MS comprises ~~an~~ a voice input-output portion for a user to perform voice communications, a radio portion for performing radio communications with a base station BS, an information display portion comprising a liquid crystal panel or the like, ~~and~~ an operating portion ~~where~~ to perform information input operations, such as number input and character input ~~are performed~~, and ~~also has~~ an internal microcomputer for controlling these parts. ~~Additionally, the~~ The mobile station MS also has software (i.e., a browser) for browsing

HTML (Hyper Text Markup Language) document data (hereinafter referred to as HTML data)., ~~and~~ The software is also for displaying ~~displays~~ an interactive screen for the user based on HTML data supplied from an information provider (hereinafter abbreviated to IP) via a mobile packet communication network.

Additionally, the mobile packet communication network MPN comprises a base station BS, a packet processing module PS, a gateway server GWS, a subscriber database UDB, a billing system BILL and a communication line for connecting these elements.

The base stations BS are positioned at predetermined intervals obtained by dividing the ground into ranges of, for example, ~~e.g.~~ a radius of 500 m, and perform radio communications with mobile stations MS visiting the radio zones formed thereby.

The packet processing module PS is a computer system ~~provided~~ in a packet switching center accommodating a plurality of base stations BS~~;~~. The packet processing module PS ~~which~~ receives packet switching requests from the mobile stations MS (packet switching service registration ~~to be~~ is explained below), and performs the switching of packets in the mobile packet communication network MPN.

The gateway server GWS is a computer system provided in a mobile packet gateway switching center for interconnecting the mobile packet communication network MPN with other networks such as the Internet INET~~;~~. The gateway server GWS ~~which~~ converts communication protocols which differ between the networks. Specifically, the gateway server GWS makes conversions ~~are made~~ between the transmission protocol for mobile packet communications networks used by the mobile packet communication network MPN and the TCP/IP used in other networks such as the Internet INET. Additionally, the gateway server GWS works in cooperation with the

IP server W, the subscriber database UDB and the billing system BILL to ~~perform~~ control ~~relating to the~~ various applications, such as information providing services and billing procedures for information transmission.

The subscriber database UDB stores a subscriber registration information file. The subscriber registration information file is composed of information relating to subscribers of the mobile packet communication network MPN and an IP registration information file composed of registration information of the IP ~~(Information Provider)~~. Fig. 2 is a data format diagram showing an example of the content of this subscriber database UDB. As shown in the drawing, the subscriber registration information file contains attribute data indicating the attributes of each subscriber, such as the telephone number of the mobile station MS, name, sex, birthdate and address for each subscriber (i.e., the user of the mobile station MS) in the mobile packet communication network MPN. Additionally, the IP registration information file contains the company name and the absolute address on the network. ~~(e.g.~~ For example, in the case of the Internet, the absolute address on the network is the URL (Uniform Resource Locator) which specifies the information resources on the WWW (World Wide Web); ~~herebelow~~ hereinafter, the absolute network address in the present embodiment shall be referred to as the URL)~~;~~. The IP registration information file also contains information indicating whether the type of billing is IP billing or not (e.g., IP billing or user billing), and information indicating whether the type of billing depends on the amount or is fixed-rate, for each IP which ~~is contracted~~ contracts to receive gateway services with the company which runs ~~this~~ the mobile packet communication network MPN. Here, IP billing refers to billing for information transmissions service which is performed, not ~~with respect to~~ billing the user who received the transmission service, but ~~with respect~~

~~to~~ billing the ~~information provider~~ IP. On the other hand, billing ~~with respect to~~ the user shall hereinafter be referred to as user billing.

The billing system BILL calculates the fees for ~~the~~ providing ~~of~~ services, based on service history information supplied from the gateway server, and issues a bill to the user or the IP. ~~While billing~~ Billing types include user billing, ~~and~~ IP billing, ~~as well as~~ amount-dependent, and fixed-rate. ~~, the~~ The billing system BILL performs billing in accordance with each billing type.

The IP server W is a server system run by the IP, which sends information ~~to be provided~~ to the users over a network in an HTML data format. The IP server W can be connected to the gateway server GWS via an exclusive line or the Internet INET, as shown in Fig. 1. As shown in Fig. 3, the IP server W, can also be ~~provided~~ inside the gateway server GWS which is provided by the owner of the mobile packet communication network MPN (hereafter referred to as an IP server W-MAX).

(2) Structure of Gateway Server

Next, the structure of the gateway server GWS shall be explained. Fig. 3 is a block diagram showing the structure of a gateway server GWS. In the drawing, the gateway server GWS comprises a system control portion I-MAX, a user information managing portion U-MAX, a billing managing portion P-MAX, an electronic mail managing portion M-MAX, an IP server W-MAX and a bus BUS for connecting these ~~parts~~ portions.

The system control portion I-MAX controls the various portions of the gateway server GWS, and functions as an interface between networks. ~~such as by performing~~ For example, the system control portion I-MAX may perform protocol conversion between the mobile packet communication network MPN and other networks such as

the Internet INET.

The user information managing portion U-MAX stores and manages subscriber registration information and IP registration information obtained by referencing the subscriber database UDB, ~~as well as~~ the correspondence between telephone numbers of the mobile stations and user management numbers (to be explained below) and the access histories of users to the IP server W (for example, the number of accesses to each IP server). Additionally, the user information managing portion U-MAX ~~performs conversions~~ converts between the telephone numbers and user management number, ~~collation of~~ collates telephone numbers and ~~comparison of~~ compares attribute data based on the above stored information.

The billing managing portion P-MAX records and manages information necessary for billing with respect to the information transmission services, and supplies this information to the billing system BILL. Specifically, it stores the fact that an electronic mail has been received from the IP server W as history information, calculates the number of packets to be exchanged when transmitting the electronic mail to the user, and stores this calculated value. Additionally, the billing managing portion ~~P-Max~~ P-MAX references the content of the subscriber database UDB transferred to the user information managing portion U-MAX, in order to determine whether or not the billing type for each IP is IP billing, and whether or not it is amount-dependent~~;~~. The P-MAX then requests billing to the billing system BILL based on the billing type.

The electronic mail managing portion M-MAX mediates the exchange of electronic mail between mobile station MS users, between mobile station MS users and users of other networks such as the Internet INET, or between ~~the~~ mobile station MS users and the IP server W. This electronic mail managing portion M-MAX ~~is provided~~

~~with~~ includes mailboxes for storing the electronic mails to be transferred for each user or for each IP server W. There are three types of mailboxes in accordance with the type of mail service, ~~and these~~ with the mailboxes being distinguished by ~~the~~ their addresses ~~of their mailboxes~~ (mail addresses).

(i) A first mailbox BOX1 is a conventional mailbox, wherein the electronic mail transferred between users is stored at mail addresses assigned for each user.

(ii) ~~Next, a~~ A second mailbox BOX2 is a mailbox for storing electronic mail transmitted from the IP to specific users ~~for the purposes of providing~~ in order to provide information or the like. Here, a specific user is a user who has already completed registration procedures with respect to the IP. This second mailbox BOX2 is used in a first type of service ~~due to~~ for push-type information transmission, ~~to be~~ described below.

(iii) ~~Next, a~~ A third mailbox BOX3, ~~as with~~ similar to the second mailbox BOX2, is a mailbox for storing electronic mail transmitted from the IP to a user ~~for the purposes of providing~~ in order to provide information. It differs from the second mailbox BOX2 in that, instead of storing electronic mail provided to users which have been pre-registered in the IP, it stores electronic mail provided to users having attributes (attributes such as sex, age, address, etc.) designated by the IP. This third mailbox BOX3 is used in a second type of service ~~due to~~ for push-type information transmission, ~~to be~~ described below.

The IP server W-MAX is a server system provided by the company owning the mobile packet communication network MPN. This IP server W-MAX, like the other IP server W, performs services such as providing information to the users.

B. Operations of the Embodiment

Next, operations of the embodiment having the above-described structure shall be explained.

First, information transmission shall be explained, followed by an explanation of the billing procedures.

B-1. Information Transmission

With regard to the information transmission according to the present embodiment, there is pull-type information transmission in which the user of a mobile station MS receives information transmissions by accessing the IP server W, and push-type information transmission in which information transmission is performed from the IP server W side to specified or non-specified users without waiting for user access. ~~Herebelow~~ Hereinafter, the explanation shall be given separately for these types.

(1) Pull-type Information Transmission

Fig. 4 is a sequence showing a basic operation for pull-type information transmission.

As shown in the drawing, the mobile station MS performs a packet switching service registration in cooperation with the packet processing module PS (step S1). The packet switching service registration is a preliminary registration procedure for enabling packet switching in a mobile packet communication network ~~MPS~~ MPN. When this packet switching service registration is completed, the mobile station MS sends a line connection request signal to the mobile packet communication network ~~MPS~~ MPN (step S2). ~~This~~ The line connection request signal is sent through the packet processing module PS to the gateway server GWS (step S3). If a line

connection is possible, then the gateway server GWS sends a line connection response signal through the packet processing module PS back to the mobile station MS (steps S4, S5). As a result, packet switching ~~becomes possible~~ is enabled between the mobile station MS and the gateway server GWS.

Next, the mobile station MS sends a connection request signal designating the URL of a desired IP server W (step S6). This connection request signal is routed through the packet processing module PS and sent to the gateway server GWS (step S7). The gateway server GWS receives the connection request signal, and establishes a link with the IP server W of the designated URL (step S8).

When a link has been established with the gateway server GWS in this way, the IP server W sends HTML data which has been prepared beforehand to the mobile station MS (step S9). This HTML data is routed through the gateway server GWS and transferred to the packet processing module PS (step S10). Furthermore, ~~at the packet processing module PS,~~ the ~~received~~ HTML data received at the packet processing module PS is transferred to the mobile station MS (step S11).

The operations of the above steps S6-S11 are repeatedly performed in accordance with the amount of ~~all of the~~ data to be transmitted from the IP server W to the mobile station MS. ~~At this time, the~~ The mobile station MS interprets the sequentially transmitted HTML data by means of the browser and displays the received information at the information display portion.

When the data transmission to the mobile station MS has been completed, the mobile station MS sends an acknowledgement signal (step S12). The packet processing module PS transfers this acknowledgement signal to the gateway server GWS ~~so~~ as ~~to make~~ a data delivery notification (step S13). When the IP server W

completes the data transmission to the mobile station MS, the link between the gateway server GWS and the IP server W is released (step S14).

Additionally, when there is a data delivery notification from the mobile station MS to the gateway server GWS, the gateway server GWS performs a billing procedure with respect to for the information transmission. The billing procedure performed at this time shall be described in detail below.

(2) Push-type Information Transmission

First, the basic operations of the push-type information transmission shall be explained, followed by explanations of two types of services due to that involve push-type information transmission.

(i) Basic Operations of Push-type Information Transmission

Fig. 5 is a sequence diagram illustrating the basic operations of push-type information transmission.

In the drawing, an IP server W first sends information to be provided to users to the gateway server GWS in the form of electronic mail (step S21). When the gateway server GWS receives the electronic mail, it stores this the electronic mail in the designated mailbox and sends a communication start notification signal to the packet processing module PS (step S22). This communication start notification signal includes information designating the destination address of the electronic mail. When the packet processing module PS receives this communication start notification signal, it calls the mobile station MS corresponding to the destination address included in the signal (step S23).

When the user of the mobile station MS performs a specified operation on the mobile station MS in response to the call, the same sequence as the above-described

previously described with reference to steps S1-S5 (shown in Fig. 4) is performed, ~~and it~~ The mobile station enters a state of being capable of packet switching with the gateway server GWS (steps S24-S28). Next, the gateway server GWS sends a reception notification signal, including the address information of the mailbox in which the electronic mail is stored, to the packet processing module PS (step S29). Furthermore, the packet processing module PS sends the received reception notification signal to the mobile station MS (step S30).

Upon receiving the ~~above-described~~ reception notification signal, the mobile station MS sends a connection request signal designating the address of the mailbox included in the reception notification signal to the packet processing module PS (step S31). This connection request signal is transferred through the packet processing module PS to the gateway server GWS (step S32). Upon receiving the connection request signal, the gateway server GWS sends a connection ~~acnowledgement~~ acknowledgement signal to the packet processing module PS (step S33). The packet processing module PS sends the received connection ~~acnowledgement~~ acknowledgement signal to the mobile station MS (step S34).

Next, the gateway server GWS reads the electronic mail received from the IP server W from the mailbox whose address is designated in the connection request signal, and transfers the electronic mail to the packet processing module PS (step S35). Upon receiving the electronic mail, the packet processing module PS sends this mail to the mobile station MS which issued the connection request (step S36).

The operations of the above steps S31-S36 are repeatedly performed in accordance with the amount of data in the electronic mail to be transmitted from the IP server W to the mobile station MS.

When the mobile station MS has received the electronic mail in this way, a delivery notification is sent to the gateway server GWS in the same manner as in steps S12 and S13 shown in Fig. 4 (steps S37, S38), and the push-type information transmission is completed.

Additionally, if there is a data delivery notification from the mobile station MS to the gateway server GWS, then the gateway server GWS performs a billing procedure ~~with respect to~~ for the information transmission. The billing procedure performed at this time shall be described in detail below.

(ii) First Type of Service ~~by means of~~ involving Push-type Information Transmission

In the present embodiment, there are two types of services ~~by means of~~ involving push-type information transmission. ~~A first type shall now be described.~~

The first type is a service of transmitting electronic mail from the IP server for the purpose of providing certain information to users who have completed a registration procedure with the IP beforehand. ~~, wherein the~~ The electronic mail is stored in the second mailbox BOX2, and the electronic mail is transmitted in response to a user request after the user has been called.

Fig. 6 is a conceptual diagram for explaining the first type. In this drawing, a user who desires services, such as information ~~provision of~~ provided by a specific IP, operates a mobile station MS to access the network, and performs preliminary registration procedures with respect to the IP server (step S61). With this access, the subscriber number of the user (i.e., the telephone number of the mobile station MS) is transferred to the gateway server GWS. The gateway server GWS converts the received subscriber number into a user management number, which is user identity information having a one-to-one correspondence with the telephone number in the user

information managing portion U-MAX. ~~in order to~~ The user management number is used to avoid the telephone number from being sent outside the packet communication network MPN. This user management number is sent from the gateway server GWS to the IP server W, and is stored in the IP server W as user registration information (step S62).

Then, if the IP server W has information to be provided to a registered user, the IP server W arranges the information as transmission data in the form of electronic mail, appends to the electronic mail the address of the second mailbox BOX2 and the user management number of the registered user to which the information is to be provided, and sends the mail to the gateway server GWS (step S63).

When the gateway server GWS receives the electronic mail from the IP server W, it stores the mail in the second mailbox BOX2 of the electronic mail managing portion M-MAX, ~~and~~ converts the designated user management number to the corresponding telephone number in the user information managing portion U-MAX, and calls the mobile station MS of that telephone number (step S64).

If the user of the mobile station MS who has received this call desires to receive the information provided by the IP server, the user operates the mobile station MS to access the gateway server GWS and requests a download of the electronic mail (step S65). The download request signal sent to the gateway server GWS at this time contains the telephone number of the mobile station MS ~~which~~ that is the source of the request. The gateway server GWS compares the telephone number of the mobile station MS from which the request signal ~~is~~ originated ~~and~~ with the telephone number corresponding to the user management number designated by the IP server W at the time of reception of the electronic mail in the user information managing portion

U-MAX~~,~~. Based on the comparison, the gateway server GWS ~~thereby judging~~ determines whether or not to permit access to the second mailbox BOX2, and thereafter reads the electronic mail from the mailbox BOX2 and sends it to the mobile station MS (steps S66, S67).

In this way, it is possible to provide information to specific users registered with the IP server W.

(iii) Second Type of Service ~~by means of~~ involving Push-type Information Transmission

~~Next, the second type shall be explained.~~ The second type is a service whereby electronic mail, sent from the IP server for the purposes of providing information to users having attributes (attributes such as sex, age and address) designated by the IP server, is stored in a third mailbox BOX3~~, and the~~. The electronic mail is transmitted to relevant users in response to user requests after ~~they~~ the relevant users have been called.

Fig. 7 is a conceptual diagram for explaining ~~a~~ the second type. In the drawing, users who are prepared to receive services such as information ~~provision~~ provided from an unspecified IP operate the mobile station MS to access the network, and perform preliminary registration procedures with respect to the gateway server GWS (step S71). With this access, the telephone number of the mobile station MS is transferred to the gateway server GWS~~, and this~~. The telephone number is stored in the user information managing portion U-MAX of the gateway server GWS as user registration information.

Then, if the IP server W has information to ~~be provided~~ provide to users, the IP server W arranges the information in electronic mail form, appends attribute data, such

as sex, age and address for specifying the user, to the electronic mail, and sends the mail to the gateway server GWS (step S72).

When the gateway server GWS receives the electronic mail containing the attribute data from the IP server W, it stores the electronic mail in the third mailbox BOX3, ~~and in the~~ The user information managing portion U-MAX, compares the attribute data appended to the electronic mail with the attribute data of each user registered in the subscriber database UDB in order to specify relevant users. For example, if the attributes designated by the IP server W are "men in ~~the~~ their thirties who live in Tokyo", then a search is made for relevant users having these attributes from among the users registered in the subscriber database UDB, and the telephone number of those users are extracted. The gateway server GWS calls the mobile stations MS of the telephone numbers extracted in this way (step S73).

If the user of a mobile station MS called ~~in this way~~ by the gateway server GWS wishes to receive the information provided by the IP server, the user operates the mobile station MS to access the gateway server GWS, and requests a download of electronic mail (step S74). At this time, the telephone number of the mobile station MS, which is the source of the request, is appended to the download request signal sent to the gateway server GWS. The gateway server GWS, in the user information managing portion U-MAX, compares the telephone number of the mobile station MS ~~from~~ which originated the request signal ~~is originated~~ with the telephone numbers of users who have completed the above-described registration procedure in order to ~~judge~~ determine whether or not to permit access to the third mailbox BOX3. ~~after~~ After which, ~~it~~ the gateway server GWS reads the electronic mail from the third mailbox BOX3 and sends it to the mobile station MS which made the request (steps S75, S76).

In this way, it is possible for the IP server W to perform an information providing service. The service is provided to users who desire the provision of information ~~from among users who are prepared to receive information~~ from ~~the~~ unspecified IP server W.

B-2: Billing Procedure

While types of billing include communication fee billing for communication services and information fee billing for information providing services of IP's, communication fee billing shall be explained as an example in the present embodiment.

Additionally, the billing procedures for the present invention include user billing ~~with respect to~~ for users who have ~~been provided~~ received information and IP ~~(Information Provider)~~ billing for billing the IP's who have provided the information. In the present embodiment, whether to perform user billing or IP billing is managed by different methods for the case of pull-type information transmission and push-type information transmission. Both cases shall be explained below.

(1) ~~In the Case of~~ Pull-type Information Transmission

Generally, in the case of pull-type information transmission, the information is provided in accordance with a request from the user~~, so that~~. Thus, user billing is more readily applicable. However, IP billing is more readily applicable in ~~there are~~ cases ~~in which~~ where the IP wishes to provide information free in response to requests from unspecified users for the purposes of advertisement or the like~~, and in this case, IP billing is more readily applicable~~. Therefore, in the present embodiment, in the case of pull-type information transmission, user billing is principally applied. ~~in principle and in~~ In exceptional cases where the IP is billed ~~billing is to be applied~~, the IP ~~which is subject thereto~~ is pre-registered in the subscriber database UDB. Then, the gateway

server GWS extracts from the subscriber database UDB a list of URL's of IP servers W to which IP billing is ~~to be~~ applied, and stores it in a memory in the billing managing portion P-MAX as an IP-billing list table.

Fig. 8 is a flow chart showing the billing procedure for pull-type information transmission. In this drawing, the user first operates the mobile station MS to access a designated IP server W. ~~, and upon~~ Upon receiving a delivery acknowledgement signal from the user, the gateway server GWS checks whether or not the URL of the IP server W accessed by the user corresponds to an IP to be IP billed, as listed in the ~~above-described~~ IP-billing list table (step S101).

~~Here, if~~ If it is not an IP sever to be IP-billed, then user billing is applied ~~as usual~~. In this case, the billing managing portion P-MAX of the gateway GWS sends a user management number of the user who received the information transmission and the number of ~~sum of~~ received packets ~~numbers~~ to the billing system BILL (step S102). The billing system BILL calculates a communication fee by multiplying the ~~sum~~ number of packets supplied from the gateway server GWS ~~with~~ by a unit price, and issues a bill to the user specified by the user management number (step S103).

On the other hand, if the URL of the IP server W accessed by the user corresponds to an IP to be IP-billed, then IP billing is applied. In this case, the billing managing portion P-MAX of the gateway server GWS sends the sum of the received packets and the URL of the IP server W which was accessed to the billing system BILL (step S104). The billing system BILL calculates the communication fee by multiplying the ~~sum~~ number of packets supplied from the gateway server GWS ~~with~~ by a unit price, and issues a bill to the IP (step S105).

(2) ~~In the Case of~~ Push-type Information Transmission

~~Next, the billing procedure for the case of push-type information transmission shall be described.~~ Fig. 9 is a flow chart showing a billing procedure for the case of push-type information transmission. In the drawing, when the gateway server GWS receives electronic mail from the IP server W in the second mailbox BOX2 or the third mailbox BOX3, it recognizes that there has been an order for push-type information transmission, and decides to apply IP billing (step S201). That is, in the case of push-type information transmission, IP billing is more readily applicable to this type of information transmission, so that in the present embodiment, IP billing is always applied.

Next, the gateway server GWS specifies the user to ~~which~~ receive the information ~~is to be provided~~ as described above, and then calls the mobile station MS to transmit the electronic mail received from the IP server to the mobile station MS., ~~but in~~ In the case of IP billing, user billing is not performed with respect to this transmission, and the IP is billed for everything.

In this case, the billing managing portion P-MAX of the gateway server GWS references the IP registration information stored in the subscriber database UDB, and checks whether the type of billing to be applied to the IP server W is amount-dependent or fixed-rate (step S202).

If the billing type is amount-dependent, the billing managing portion P-MAX of the gateway server GWS sends the sum of the packets exchanged in the transmission of electronic mail and the URL of the IP server W which was the source of the electronic mail to the billing system BILL (step S203). The billing system BILL multiplies the ~~sum~~ number of the packets supplied from the gateway server GWS ~~with~~ by a unit price to calculate the communication fee, and issues a bill to the IP (step

S204).

On the other hand, if the billing type is fixed-rate, then the billing managing portion P-MAX of the gateway server GWS sends the URL of the IP server W to the billing system BILL ~~at the same time as~~ when the electronic mail is received from the IP server, so as to ~~order billing to that~~ the IP (step S205). The billing system BILL receives ~~this~~ the URL and issues a bill of a standard amount to the indicated IP (step S206).

If the fixed-rate billing format is one where billing is applied to a standard period of time, such as ~~by~~ monthly ~~units~~, the IP is billed whether or not the electronic mail from the IP server W reaches the gateway server GWS. Therefore, in this case, there is no cooperation between the gateway server GWS and the billing system BILL, and the billing system BILL independently issues a bill to the IP at regular periods.

C: Modification Examples

As previously mentioned, the present invention is not restricted to the above-described embodiments. The present invention can have various modifications within the range of the technical concept of the present invention, for example the following.

(1) In the embodiments, information is provided to mobile stations MS belonging to a mobile packet communication network MPN from another network such as the Internet INET (first communication network)., ~~but if~~ If for example there exists ~~another~~ a global network ~~which can replace~~ other than the Internet INET, then the present invention is applicable to cases wherein information is provided from such a network to a mobile station MS belonging to a mobile packet communication network

MPN. In this case, the information resource of the IP server W can be specified by means of an absolute address defined in the global network to which it is applied, instead of by a URL.

Additionally, the network (second communication network) to which the user terminal belongs is not restricted to being a mobile packet communication network MPN.~~, and the~~ The invention is applicable for providing information to user terminals belonging to local networks such as a fixed network which includes stationary terminals.

Furthermore, the present invention is not restricted to packet switching networks, and is applicable to data communication networks which perform other types of data communications.~~, and the~~ The communication protocols indicated in the embodiments represent only one possible example. Additionally, the form of the data transmitted from the IP server is not restricted to HTML format, and other formats may be employed. For example, if the transmitted information is only text data, then it is of course not necessary to employ a data format such as HTML which can handle multimedia.

(2) In the embodiments, the communication fee billing for pull-type information transmission was uniformly made amount-dependent, but the present invention is not limited thereto.~~, so that it~~ It is possible to register information indicating whether the billing is amount-dependent or fixed-rate in the subscriber database UDB_1 as in the case of push-type information transmission, and to perform billing procedures in accordance with the type of billing. ~~In the case that~~ Where a fixed-rate system is employed for pull-type information transmission, the user or IP is billed a standard amount regardless of the number of exchanged packets, as in the case of push-type information

transmission.

Additionally, while the billing type was set for each IP in the IP registration file of the subscriber database UDB in the embodiments, the present invention is not restricted thereto.~~, and it~~ It is possible to set the billing type for each user in the subscriber registration file. Additionally, when wishing to set the billing type according to the IP and the user, ~~then~~ the billing type for each user can be set for each IP in the IP registration information file.~~, or~~ Alternatively, the billing type for each IP can be set for each user in the subscriber registration information file.

(3) While only communication fee billing was explained in the embodiments for the purpose of ~~retaining~~ simplicity, the present invention can be similarly applied to information fee billing. ~~However, when~~ When employing amount-dependent information fee billing, billing does not depend on the number of exchanged packets as in communication fee billing.~~, but it~~ Instead, it is possible to apply various billing types such as for example, billing in accordance with the number of exchanged electronic mails or when wishing to change the amount depending on the case, appending amount information concerning an electronic mail transmission to the electronic mail sent from the IP server W ~~to send~~ to the gateway server GWS.

Additionally, in the case of information fee billing, it is possible to perform only user billing and ~~to~~ not to perform IP billing. In this case, all of the billing types in the IP registration information file in the subscriber database UDB can be set to user billing or the billing procedure can be ~~not performed~~ disabled with respect to IP's which are set for IP billing.

(4) In the embodiments, the billing type in pull-type information transmission was decided by the gateway server GWS having a list table of IP-billing and referencing the

table, but the present invention is not restricted thereto.~~, and it~~ It is possible, for example, to append information indicating ~~whether~~ IP billing or not by adding a tag to the HTML data sent from the IP server W.~~, and to have the~~ The gateway server GWS may then decide the billing type based on this information.

(5) The structure of the network in the embodiments is ~~no more than~~ one possible example, and the present invention is not restricted to such a structure. For example, it is possible to divide up the functions among a plurality of nodes, such as by ~~arranging into divisions of~~ dividing nodes having a communication protocol converting function and nodes having other functions.

(6) In the embodiments, the IP server W manages user registration information with respect to the IP's in a first type of service by means of push-type information transmission.~~, but the present invention may be such that~~ Alternatively, the gateway server GWS may handles the management of user registration information. For example, as shown in Fig. 10, a sequence of ~~among the~~ dialog screens (1-5) may be displayed when a user performs registration procedures with the IP.~~, it is possible to send and display only a~~ A dialog screen (hereafter referred to as a registration screen) for aiding in the registration operation may be sent as HTML data prepared by the gateway server GWS to the mobile station MS of the user for display.~~, then store and manage the~~ The user registration information may then be stored and managed at the gateway server GWS based on the user registration procedures. In this case, it is possible for the gateway server GWS to ~~find~~ determine with which IP server W the user has performed registration procedures.~~,~~ The determination may be based on the address information such as the URL designated when the user accesses the IP server W. ~~Therefore, if the~~ The gateway server GWS may therefore provide a registration screen

of ~~has~~ HTML data for ~~providing a registration screen with respect to~~ any of a plurality of IP servers W ~~in correspondence to~~ based on the address information such as the URL. ~~, then it is possible to specify the~~ The HTML data to be sent to the mobile station MS of the user as a registration screen may also be specified based on the address information, such as the URL designated by the user.

(7) While in the embodiments, in the case of push-type information transmission, the user of a mobile station MS who has received a call for electronic mail operates the mobile station MS to access the gateway server GWS and download the electronic mail, ~~but the~~ The present invention is not restricted thereto. ~~, and it~~ It is possible ~~to make the process such~~ that when the mobile station MS receives a call, it automatically accesses the gateway server GWS and downloads the electronic mail without waiting for the instruction operations of the user.

(8) In the embodiments, IP billing is always used for push-type information transmission, but the present invention is not restricted thereto. ~~, and user~~ User billing can also be applied in the case of push-type information transmission. In this case, as with the pull-type information transmission described above, an IP billing list table should be made based on the set contents of a subscriber database UDB ~~, this table~~ and should be referenced in order to determine whether to use IP billing or user billing. ~~, and in~~ In the case of user billing, the procedures appropriate for user billing should be followed.

Additionally, even in the case of exclusively billing the IP ~~billing~~, it is possible to prepare an IP billing list table for having a list of relevant IP servers to be IP-billed, so that when there is a request for push-type information transmission from an IP server not listed in ~~this~~ IP billing list table. The IP billing list table may then be used so that

the information transmission will not be routed, such as by disposing of the sent electronic mail.

CLAIMS

1. A billing method in a communication network including an information provider server device, a plurality of user terminals which receive information from said server device and a transfer device for routing information transmission between said server device and said user terminals; wherein said transfer device comprises:

a step of recording billing management information for identifying server devices which are to be subject to IP billing which is billing with respect to information providers;

a step of detecting a network address of said server device designated when said user terminal receives an information transmission from said server device;

a step of determining whether or not said server device is to be subject to IP billing based on the detected network address and said billing management information; and

a step of performing a billing procedure with respect to the information provider which performed the information transmission if said server device is determined to be subject to IP billing.

2. A billing method as recited in claim 1, wherein said transfer device does not route an information transmission if it is determined not to be subject to IP billing.

3. A billing method as in claim 1, wherein said transfer device performs a billing procedure with respect to users who have received the information transmission if it is determined not to be subject to IP billing.

4. A billing method in a communication network including an information provider server device, a plurality of user terminals which receive information from said server device and a transfer device for routing information transmission between said server device and said user terminals; wherein said server device comprises:

a step of including billing information which indicates whether or not to use IP billing which is billing with respect to the information provider in the transmission data supplied to said user terminals in response to a request; and

said transfer device comprises:

a step of determining whether or not said information transmission is subject to IP billing based on said billing information when routing the exchange of said transmission data; and

a step of performing a billing procedure with respect to the information provider which provided said information transmission if it is determined to be subject to IP billing.

5. A billing method as in claim 4, wherein said transfer device performs a billing procedure with respect to users who have received the information transmission if it is determined not to be subject to IP billing.

6. A billing method in a communication network including an information provider server device, a plurality of user terminals which receive information from said server device and a transfer device for routing information transmission between said server device and said user terminals; wherein said transfer device comprises:

a mailbox for mediating push-type information transmission that is subject to IP billing which is billing with respect to the information provider;

and comprises:

a step of storing in said mailbox information mail sent from said server device designating a desired destination and the address of said mailbox;

a step of transmitting the information mail stored in said mailbox to user terminals which are the designated destinations; and

a step of performing a billing procedure with respect to the information provider which offered said information transmission with respect to push-type transmission services through said mailbox.

7. A billing method in a communication network including an information provider server device, a plurality of user terminals which receive information from said server device and a transfer device for routing information transmission between said server device and said user terminals; wherein said transfer device comprises:

an IP-billed mailbox for medating push-type information transmission that is subject to IP billing which is billing with respect to the information provider; and

a user-billed mailbox for mediating information transmission that is not subject to IP billing;

and performs a billing procedure with respect to the information provider which offered said information transmission with respect to push-type information transmission services through said IP-billed mailbox; and

a step of performing a billing procedure with respect to the user that received said information transmission with respect to information transmission services through

said user-billed mailbox.

8. A billing method as in any one of claims 1-7, wherein the object of said billing is a communication fee with respect to communication services for the information transmission.

9. A billing method as in any one of claims 1-7, wherein the object of said billing is an information fee with respect to information provided by the information transmission.

10. A billing method as in claim 9, wherein said transfer device performs a billing procedure of information fees with respect to users if it is determined as not being subject to IP-billing, and otherwise does not perform a billing procedure of information fees.

11. A billing method as in any one of claims 1-7, characterized in that said server device belongs to a first communication network following a first communication protocol and said plurality of user terminals belong to a second communication network following a second communication protocol different from that of said first communication network; and

said transfer device is a gateway for converting between said first and second communication protocols and routing information transmissions.

12. A billing method as in claim 11, wherein said second communication network

is a local network accommodating specific user terminals; and

said first information communication network is a global network interconnecting information resources such as said server device assigned identification information for identifying an absolute network address.

13. A billing method as in claim 12, wherein said second communication network is a mobile communication network accommodating a plurality of user terminals which are mobile terminals, and

said first information communication network is the Internet.

ABSTRACT

When an IP (Information Provider) server is accessed from a mobile station, a gateway server determines whether or not the IP server is to be IP billed (S101). If it is not to be IP billed, then user billing is applied. In this case, the gateway server sends a user management number of the mobile station and the number of exchanged packets to a billing system (S102). The billing system calculates a communication fee in accordance with the number of packets, and issues a bill to the user specified by the user management number (S103). On the other hand, if the accessed IP server is to be IP billed, then IP billing is applied. In this case, the gateway server sends the number of exchanged packets and the address of the accessed IP server to the billing system (S104). The billing system calculates a communication fee in accordance with the number of packets, and issues a bill to the IP (S105).